



ELMS FARM MATHEMATICS POLICY

VISION

We want all our pupils to experience deep, sustained understanding so that they become happy and confident mathematicians, throughout their learning and into their adult life.

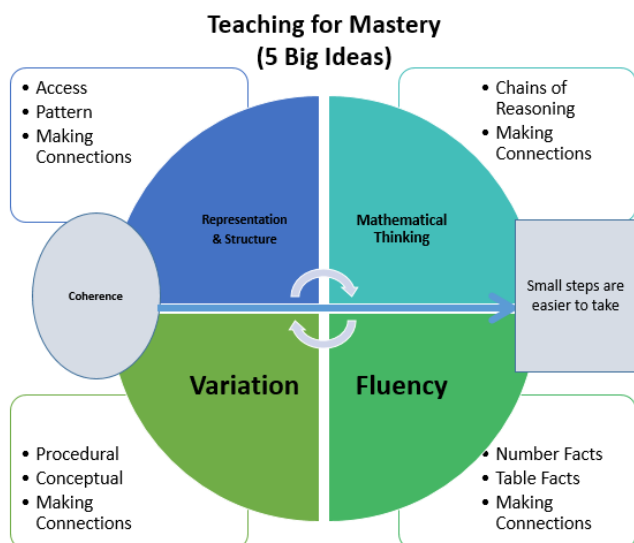
Through a positive, caring environment, we, at Elms Farm, nurture confidence in the subject and a love of mathematics, to enable every child to reach their full potential. We promote a ‘can do’ attitude to maths without a fear of making mistakes. Children will be given time, support and resources to develop a depth of understanding in maths, because we believe that every child is entitled to a good mathematical education.

INTRODUCTION

In September 2018, Elms Farm started its journey towards a mastery approach to the teaching and learning of mathematics. We understand that this will be a gradual process and may take time to fully embed. The rationale behind changing our approach to teaching mathematics arose from our involvement in the NCETM Maths Hub and Teaching for Mastery Programme and our belief in the philosophy that all children can achieve, as well as the 2014 National Curriculum, which states:

- *The expectation is that most pupils will move through the programmes of study at broadly the same pace.*
- *Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.*
- *Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.*

Our teaching for mastery is underpinned by the NCETM’s 5 Big Ideas:



Mathematical Thinking allow children to make chains of reasoning connected with the other areas of their mathematics.

Representation and Structure ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns as well as specialise and generalise whilst problem solving.

Coherence is achieved through the planning of small connected steps to link every question and lesson within a topic.

Variation is used within lessons both in pictorial representations and abstract tasks.

Fluency relentlessly focuses on number and times table facts.



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INTENT

We offer our children an engaging, balanced mathematics curriculum and good quality teaching to produce individuals who are numerate, creative, independent, inquisitive, enquiring and confident. We aim that all pupils:

- Become **fluent** in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Can **solve** problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios.
- Can **reason** mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.

Our pupils will

- be competent and confident in taking risks to apply mathematical knowledge, concepts and skills.
- be able to solve problems, reason mathematically and think logically and systematically.
- be able to work independently and in cooperation with others.
- be able to use and apply mathematics across the curriculum, and to understand the application of mathematics in real life contexts and scenarios.

IMPLEMENTATION

Teaching for Mastery Principles

We believe that the vast majority of children can succeed in learning mathematics in line with national expectations.

- The whole class is taught mathematics together, expectation here is that every child will master the key concept, whilst some will work more deeply on challenging tasks.
- Children are seated in mixed ability groups, doing the same work at the same time, with there being no differentiation by acceleration to new content.
- Differentiation is in the form of the amount of time children will spend using concrete resources to grasp concepts. With higher attainers challenge is presented through more demanding problems, which deepen their knowledge of the same content.
- Further differentiation will be seen through targeted questioning and the feedback and scaffolding individual pupils receive in class, as they work through problems, will differ.
- Depth of understanding and readiness for the next stage (whether it is the next lesson, next unit of work, year or key stage) is prioritised, alongside high expectations of every child.



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- Precise mathematical language, often couched in full sentences, is used by teachers so that mathematical ideas are conveyed with clarity and precision.
- Sufficient time is spent on key concepts to ensure learning is well developed and deeply embedded before moving on.

Maths Talk

We value 'mathematical talk' where children get plenty of opportunities to talk about and evaluate their mathematics, this being additional to their daily lesson. The format is as follows:

- To take place at least three times a week
- Short session 10 to 15 minutes
- Increase confidence through positive shared experiences
- Develop computational fluency (efficient, flexible and accurate methods)
- Help learners to think and reason like a mathematician
- Help learners to make connections and look for relationships
- Develop mathematical language
- Develop skills of using and applying

At Elms Farm there is a consistent approach to planning, which is undertaken at three levels:

- **Long term planning** is detailed in the programmes of study in the National Curriculum (2014) for Mathematics. These are set out for KS 1 and KS 2, as end of year the key objectives to be taught in each year group.
- **Medium term planning** details the main teaching objectives for each term, ensuring that there is an appropriate balance and distribution of work across each term. Termly plans produced by White Rose Maths ('Small Steps') are documentations used to support this planning process.
- **Short term planning** where lessons are collaboratively planned in year groups, using a common planning template for a flip chart. Teachers are specifically asked to consider: learning objectives; basic skills; key questions; representations / resources; stem sentences; vocabulary; misconceptions and role of adult support. They are advised to refer to 'Maths No Problem' or 'Power Maths' textbooks for examples of variation and how to scaffold those learners who may struggle to grasp concepts.

In Nursery and Reception, Mathematics is planned similarly, under the guidance for the Early Years Foundation Stage Curriculum – Problem Solving, Reasoning and Numeracy (PSRN), using the Early Years Outcomes. The children are given rich opportunities to develop their understanding of number, calculating, measurement, pattern and shape and space through structured and child-initiated play-based activities both indoors and out. This enables the children to enjoy, explore, learn, practise and talk about their developing understanding of mathematics.



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A Typical Lesson

Lessons may vary in length but will usually last for about 60 minutes in Key Stage 1 and 2. The learning will focus on one key conceptual idea and connections are made across mathematical topics. A typical lesson in Year 1 to 6 will have the following common components:

- ◆ **MOT / Basic Skills** (10 mins): This may focus on practising number facts (eg. number bonds or times tables) or arithmetic skills.
- ◆ **'Anchor Task'** (5 mins): Whole class teaching where children are encouraged to explore a context-based problem themselves to see what they already know. Concrete resources and representations are made available for learners to use. During this time, the teacher and teaching assistant will spend time observing and questioning the children. The understanding of those children, who provide a quick correct answer will be probed further ('Dive deeper') using questions based around variation theory.
- ◆ **'Let's Learn'** (15 mins): This 'ping -pong' session encourages children to move from concrete to pictorial and pupils will 'do and show'. Pupils have opportunities to talk to their partners and explain/clarity their thinking. Pupils are expected to respond in full sentences, using precise mathematical vocabulary.
- ◆ **Independent Practice** (25 mins): Here the expectation is learners independently complete carefully crafted questions focused on the one key piece of learning. There are three sections, which are essentially same but have been given different titles to make them more 'child friendly' according to key stage:
 - Fluency - Do it:** Simple examples linked to key learning of the lesson. Focus on procedural fluency: 'what it is' standard & non-standard (5 / 6 questions);
 - Reasoning - Twist it:** Focus on 'what it's not.' Active argument (yes/no, true/false, focus on misconceptions/mistakes);
 - Problem-solving - Deepen it:** focus is on solving range of problems: empty box; find the symbol; here's the answer, generate the question. Probing questions how do you know? Can you prove it? Can you represent it another way? What's the value? What's the same/different about? Can you explain that?
- ◆ **Dong Nao Jin** – Super Challenge (5 mins): To end the session, this can be a super challenge, that may touch upon next day's learning. Children don't have to be able to complete this but have some ideas to share.



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Resources

When introduced to a key new concept, pupils should have the opportunity to build competency in this topic by taking the following approach:

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – pupils should then build on this concrete approach by using pictorial representations. These representations can then be used to reason and solve problems.

Abstract – with the foundations firmly laid, learners should be able to move to an abstract approach using numbers and key concepts with confidence.

Each classroom will have a designated maths area which is labelled with resources accessible for children to independently select them to support their learning. A bank of essential mathematics resources including Numicon, Dienes, Counters and Cuisenaire rods, is kept in each classroom. Appropriate resources for each lesson are to be neatly stored in Maths white IKEA trays on each table. Additional topic specific resources (Geometry, Measures etc.) are stored centrally.

Display

We aim to provide a stimulating, number-rich environment with appropriate resources so that pupils can fully develop their mathematical skills. Each classroom should have specific resources that must be displayed in the classroom. These should include: display of appropriate number line; large 100 square; large multiplication grid; place value headings; place value chart.

For consistency across the school, all classes have the same following format for learning walls:

- Black backing paper with blue border and title 'Mastering Maths' in colourful lettering. Board to be split into eight sections with:
- Key vocabulary and sentence stems;
- Examples of standard, non-standard and non-example (What it is and what it also is) and (what it is not);
- Shared / modelled work: 'Show it', 'Draw it', 'Explain it' and 'Prove it' or 'Do it' 'Twist it' and 'Deepen it';
- Pictorial representations /pictures;
- 4Cs (Consider, Construct, Calculate and Check);
- Examples of children's work. Any written and mental strategies should be clearly displayed in line with the calculation policy.



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Homework

There is an expectation that all pupils will learn their times tables. Teachers should send additional homework to practise and consolidate their understanding. For Year 1 - 5 weekly homework will focus on children learning Number Facts (eg. all number bonds with in 10 or up to 20, multiplication tables etc.).

- There are useful websites listed on the school website where children can access number facts games at home.
- Teachers will need to devise ways of recording which facts children know, have learnt and those facts still unknown and then monitor this closely each week.
- Times Table Rockstars should be set as regular weekly homework. All pupils should be given their login details, which are to be pasted in their Reading Diaries.
- Yr 6 class teachers need to set appropriate homework that reflects and complements class teaching for the week/topic.

Parental Involvement

At Elms Farm, we recognize that parents / carers can make a significant difference to a child's progress in Maths. We encourage parents to be actively involved by:

- Providing regular parent's evenings, which give them verbal and written information on their child's progress and their targets for the future.
- Providing an end of year report, which outlines progress and attainment.
- Inviting parents to information events on how we teach mathematics and how they can help.
- Holding workshops for parents focusing on areas of mathematics to support homework activities.
- Providing additional information, guidance and support via the school website.
- Providing regular updates on individual class events on 'Class Dojos'.



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IMPACT

Feedback and Marking

- Teachers and Teaching Assistants are expected to use appropriate feedback methods during the lesson. Feedback should be effective in ensuring pupil progress throughout a lesson or unit of work. It is recognised that live feedback in addressing errors and misconceptions is the most effective.
- LOs are highlighted in either pink (working towards the objective) or green (achieved the objective). Pink highlighter can be used to direct children to errors, particularly for lower attainers, who may need more guidance.
- To support and guide children, teachers are encouraged to provide models. Adults should promote the idea of mistakes being good to learn from. Use visualizer to unpick misconceptions (where child went wrong).
- When marking books, no comment or gap task is required. Pupils are to self / peer mark where appropriate - if there is a misconception this can be addressed by the teacher straight away. Any written comments should encourage children to be 'maths detectives' (eg. 'two of these are incorrect - find them and fix them').
- Teachers should use codes to inform children of their errors. Children are expected to correct errors in purple pen (unless drawing in maths). If children make repeated errors or if there is a bigger misconception that needs addressing, this should be done through conferencing, verbal feedback or TA intervention.
- Same day intervention or conferencing work must be completed at the front of their book. TA led interventions should be evidenced in the back of pupil books.
- Praise for work done well including stamps, stickers and comments can be used at the teacher's discretion.

Assessment

- **Formative assessment for learning** should occur throughout the entire maths lesson, enabling teachers/teaching assistants to adjust their teaching/input to address the needs of the children.
- **Arithmetic Check** using Rising Stars should be completed every fortnight (Friday). From this, gaps should be identified and used to inform future planning of Basic Skills.
- Immediately after a unit of work has been taught, **White Rose end of block assessments** must be administered to check pupils' understanding. Test scores should be recorded on the whole school 'End of Block Assessments' spreadsheet.



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- Teachers should refer to the NCETM Assessment Booklet appropriate for their year for examples of mastery and mastery with greater depth.
- Using a range of these sources, pupils are assessed against their year group objectives every half term. Criteria Maths records based on NC stages is updated half termly.
- Towards the end of the school year, **NFER standardised tests** are to be administered to assess progress for year groups (for Yr 1, Yr 3, Yr 4 and Yr 5). Teachers need complete NFER analysis grids to identify common errors / misconceptions to inform planning of basic skills. National Curriculum tests are used at the end of KS1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments.

Monitoring:

The Maths Lead alongside SLT are responsible for monitoring and evaluating mathematics curriculum. Mathematics is rigorously monitored through a triangulation of observing the teaching and learning of lessons, book looks, flip chart planning trawls and pupil surveys which continually reflect back to the school set targets.

- Flip chart planning is required to be readily available electronically on the staff server. This will allow easy access for planning to be regularly monitored by the Maths Lead.
- Pupil Progress Meetings are regularly held with Senior Management Team to review learning that has taken place and progress in books.
- Analysis of assessment data in order to plan whole school improvement in Mathematics.
- Maths Lead will provide a termly report to keep the Head Teacher, governors and external partners informed, in which the strengths and weaknesses in mathematics are evaluated and areas for further improvement are identified.

Date: May 2020

Date for review: May 2021